



Article 1 in The European Charter of Fundamental Rights (2009)

"The dignity of man is untouchable. It is to respect and to protect"

"Den menneskelige verdighet er ukrenkelig. Den skal respekteres og beskyttes."


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The right to privacy

The right to privacy is our right to keep a domain around us, which includes all those things that are part of us, such as our body, home, thoughts, feelings, secrets and identity.

The right to privacy enables us to choose which parts in this domain can be accessed by others, and control the extent, manner and timing of the use of those parts we choose to disclose.

Yael Onn, et. al., *Privacy in the Digital Environment*



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Personal data

Any information and assessments that may be linked to a natural Person



*Norwegian Personal Data Act
(Personopplysningsloven § 2 Definisjoner)*

Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data

Personal data: Any information relating to an identified or identifiable natural person

An identifiable person is one who can be identified, directly or indirectly,

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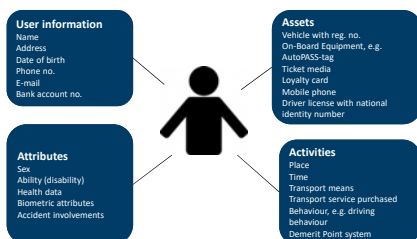
Many ITS applications collect personal data



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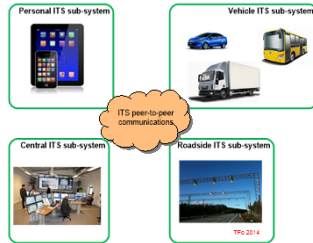
Data related to an ITS service User



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Where do we find the personal data?



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Three major challenges in ITS services?

1. Privacy

2. Security in ICT systems supporting the ITS services

3. Authorities, operators and users awareness in relation to security including privacy



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Examples on privacy threats

- **The ITS service User was there**
Electronic tracking of transport users (construction of travel patterns)
- **The ITS service User is there now**
Registration of the presence of a person
- **Person profiling**
Coupling of information from ITS with information in other systems



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Some examples on where and when personal data may be collected



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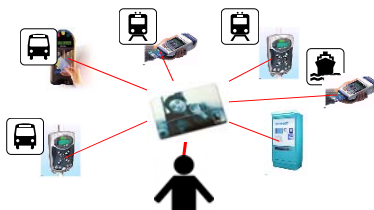
Electronic fee collection by means of an OBE and Automatic Number Plate Recognition (ANPR)



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Electronic ticketing



NB! We have an industry norm in Norway!

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Access control based on ANPR



Foto: <http://www.anpr-tutorial.com/>

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Parking payment and parking surveys based on OBE or ANPR



Plate	Time	Status	Revenue
12345678	10:15	Paid	240.00
87654321	10:20	Paid	240.00
11223344	10:25	Paid	240.00
55667788	10:30	Paid	240.00
99887766	10:35	Paid	240.00
44556677	10:40	Paid	240.00
33445566	10:45	Paid	240.00
22334455	10:50	Paid	240.00
11223344	10:55	Paid	240.00
99887766	11:00	Paid	240.00
87654321	11:05	Paid	240.00
76543210	11:10	Paid	240.00
65432109	11:15	Paid	240.00
54321098	11:20	Paid	240.00
43210987	11:25	Paid	240.00
32109876	11:30	Paid	240.00
21098765	11:35	Paid	240.00
10987654	11:40	Paid	240.00
09876543	11:45	Paid	240.00
98765432	11:50	Paid	240.00
87654321	11:55	Paid	240.00
76543210	12:00	Paid	240.00

Foto: Parking Trend International - June 2008

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Traffic data collection based on OBE, ANPR and mobile phones ID



Foto: Parking Trend International - June 2008

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Examples

- Individual speed
- Origin - Destination matrixes

Enforcement of Payment of fees, taxes and insurance based on ANPR



Foto: NIK/NIK

- Control of :
- Annual vehicle fee
 - Insurance
 - EU vehicle control



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Mobile unit for collection of traffic data (ASSET – EU prosjekt)



Foto: ASSET

- ASSET mobile unit is equipped with 3D-camera, infrared camera and ordinary camera for collection of data from individual vehicles:
- Number plate data
 - Time and place for road use
 - Type of vehicle
 - Vehicle dimensions
 - Speed
 - Headway
 - Picture of vehicle front including number plate
 - Usage of safety belt



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Personal advertising based on ANPR



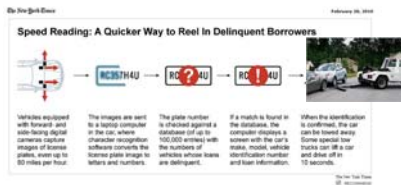
Foto: www.saftspeed.org.uk/

- A hidden camera reads the number plate and access the UK vehicle register to find the car make and model
- The driver is informed about which oil type to use for his vehicle referring to the license plate number of the vehicle



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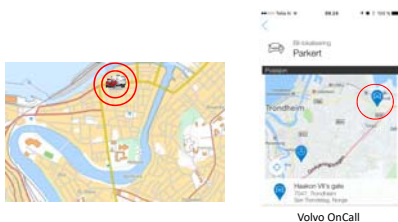
Enforcement of non-performing loans based on ANPR



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Fleet management with vehicle tracking, real time applications, stolen vehicles and smart apps (e.g. Volvo OnCall)



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Jamming of GPS – privacy or crime?



**GPS-JAMMERE
Tyver, taxi-sjåfører og
radiosendere**

Merger mottar innvilgt på brev etter pålegg 10. januar 2014

Teknisk Ukeblad 12. mars 2014

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Location based services



- Information about
 - Services
 - Points of Interest
 - Public transport
- Driver assistance systems, e.g. route guidance

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Pay as you drive



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Security in ITS sub-systems

Potential attackers:

- Hackers
- Activists
- Terrorists
- Criminal organisations
- ITS service Users
- Operators
- Authorities
- Foreign powers



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How to get access to the vehicles internal ICT system?



Valve On Call

Best feature

Streaming from older and 2011 Xbox one brings you the ability to access your library from your iPhone, iPad or PlayStation 3 and even on Steambox and it also allows you to share your documents via USB. Depending on your model be able to

Your wireless headphones, such as the Logitech wireless headset, are the best.

Control your last gaming device. If the device is supported with a built-in gaming mode.

With our wireless on a map is using the wireless speakers and the controller.

Use the same device if it's wireless, wireless and the same device.

Use the same device if it's wireless.

Require more than one device from the Logitech.

Have an electronic device, such as a tablet, that will be able to view the map with the vehicle.

iTunes Appstore



What is the awareness of authorities, operators and users?

Literature review shows that :

- The awareness of safety and security in intelligent transport systems is limited and there is a gap that should be closed
- The awareness on privacy is better which probably is caused both by laws and regulations and more attention regarding privacy in other sectors, e.g. the health sector.



Could privacy be ensured in
intelligent transport systems?

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'The simplest is often the best'

*Avoid as far as possible
collecting and/or using data
that could be linked to a
person*



*In worst case, - encrypt or
make the data anonymous*

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Privacy by design shall be the default
methodology



*Specification and development of ITS applications should
take place in close cooperation with the Data
Inspectorate*

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Three very important principles

CIA



- **C**onfidentiality – data shall be protected against non-authorised access (Konfidentiell)
- **I**ntegrity – data shall not be changed between authorised sender and authorised receiver of the data (Integritet)
- **A**vailability – data shall be available when the ITS application requires the data (Tilgjengelighet)

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Other principles

- User consent of the use of personal data
- Deletion of data as soon as they have served their purpose
- Transparency for the Transport user
- Transport user involvement
- Easy accessible and understandable description of the purpose of the data management
- Minimisation of the data collection
- Limited use of the collected data
- Personal data shall be correct, relevant, timely and complete
- The data shall be protected against loss and non-authorised access, deletion and changes
- Revisions shall be carried through
- Training of personal handling the data



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Could privacy be ensured in intelligent transport systems?

The answer is Yes, if

Thank you for your attention!

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